

# Chapter 6: Networking Beyond the FERMI

## Windows 2000 Domain

### 6.1 Connecting to Remote UNIX Hosts

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If you can accomplish all your computing tasks in the Windows environment with no need for UNIX, ignore this section.

In order to connect over the network from your Windows desktop to any remote UNIX host, you must have networking software installed on your desktop. To connect to a UNIX host at Fermilab, virtually all of which are Kerberized, your networking software must use Kerberos authentication.

If you have a Kerberos principal for the Windows FERMI.WIN.FNAL.GOV domain, then you also have one for the UNIX FNAL.GOV realm. If not, request a principal from the *Request Form for Computing Username and Primary Accounts* at

[http://www.fnal.gov/cd/forms/acctreq\\_form.html](http://www.fnal.gov/cd/forms/acctreq_form.html).

Check with your supervisor regarding the software that your experiment or group uses for this purpose. There are a few choices.

The Computing Division recommends WRQ® Reflection software. Reflection can be copied from the Pckits server once you've obtained a license for it (contact your supervisor). The software consists of:

- A "Kerberos manager" that allows you to authenticate to the FNAL.GOV realm from your desktop, change your FNAL.GOV realm password, and so on
- Kerberized versions of telnet, ftp and OpenSSH
- Terminal emulation and Xwindows software

Other options include (these are not supported by the Computing Division):

- MIT Kerberos client software and Leash 32 GUI for use with Exceed 7.x telnet and FileZilla FTP clients
- Heimdal Kerberos for use with Cygwin

Following are links to both installation and use instructions in the *Strong Authentication at Fermilab* manual.

## Installation

- Chapter 19: Installing and Configuring WRQ® Reflection on a Windows System  
<http://www.fnal.gov/docs/strongauth/html/winadmin.html>
- Chapter 21: Installing MIT Kerberos on Windows, for use with Exceed 7 and FileZilla  
<http://www.fnal.gov/docs/strongauth/html/winexceed7.html>
- Chapter 22: Installing Heimdal Kerberos for use with Cygwin  
[http://www.fnal.gov/docs/strongauth/html/cygwin\\_heimdal.html](http://www.fnal.gov/docs/strongauth/html/cygwin_heimdal.html)

## Use

- Section 4.6 Logging In Through WRQ® Reflection Software from Windows  
[http://www.fnal.gov/docs/strongauth/html/access\\_fermi.html#26791](http://www.fnal.gov/docs/strongauth/html/access_fermi.html#26791)
- Section 7.1 Logging In Through Kerberized Exceed 7 Software from Windows  
[http://www.fnal.gov/docs/strongauth/html/access\\_unsupp.html#46585](http://www.fnal.gov/docs/strongauth/html/access_unsupp.html#46585)
- (for Heimdal/Cygwin) Section 4.2 Connecting from One Kerberized Machine to Another  
[http://www.fnal.gov/docs/strongauth/html/access\\_fermi.html#63143](http://www.fnal.gov/docs/strongauth/html/access_fermi.html#63143)

## 6.2 Windows AFS Client for File Transfers to AFS Space

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### 6.2.1 What is AFS?

AFS is a shared file system. “AFS space” is a UNIX directory/file area starting at `/afs` that can be shared between computers. This is handy when large numbers of people need to access files in an area. Fermilab has a “cell” in AFS space, which is simply the area under the AFS root directory belonging to Fermilab. Fermilab’s cell is `/afs/fnal.gov/`. Any directory under this cell, e.g., `/afs/fnal.gov/x/y/z/`, has exactly the same contents when

viewed/manipulated on one computer as on another, provided both computers implement AFS with the Fermilab cell. Users are required to authenticate to AFS.

## 6.2.2 AFS and You

“So,” you might ask, “why do I need to know anything about AFS?”

### Personal Home Pages

Everyone with an FNALU account (see section 2.2 *Kerberos Principals and Primary Accounts*) has a home area in Fermilab’s AFS cell. FNALU account holders are encouraged to maintain a professional home page in the `public_html` area under their home directory which colleagues and others can access via the URL `http://home.fnal.gov/~<username>/`. (Information about professional home pages can be found at `http://www.fnal.gov/cd/webgroup/webhelp/homepages.html`.)

You will need to log into an FNALU node at least once to note your home directory path. Login instructions can be found in Chapter 4 of the *Strong Authentication at Fermilab* manual at `http://www.fnal.gov/docs/strongauth/html/access_fermi.html#8346`. Once you’re logged in, type `pwd` to display your present working directory path. The path will be of the form `/afs/fnal.gov/files/home/room<n>/<username>`, where `<n>` is an integer.

Back in Windows, create a web page for yourself using your favorite editor. Then move the page over to your `/afs/fnal.gov/files/home/room<n>/<username>/public_html` directory, using the AFS client or other tool.

### Official Fermilab Web Pages

Many of the official web pages for the lab and for its individual divisions and departments are maintained in Fermilab’s AFS cell, since lots of different people are responsible for maintaining these files. If you’re one of these people, you will need to be able to move web page files between your Windows resources where you create the files, and AFS space where the files are accessible from the internet. Find out from your supervisor which AFS directories you’ll need to access.

### 6.2.3 Why Use the Windows AFS Client?

Many Windows editing applications contain functions that allow you to publish your pages automatically. However, with Kerberos authentication implemented at Fermilab, these functions are typically no longer usable for us. You could use an FTP program that is Kerberos-aware (e.g., WRQ® Reflection's FTP client), but the Windows AFS client may be easier.

The Windows AFS client allows you to map directories under Fermilab's AFS cell to your Windows machine so that these directories appear as mounted drives or file shares, just as local or networked Windows resources do. You can then move and copy files to and from AFS drives/folders the same as you do between your other drives/folders. Your AFS authentication is sufficient; you do not need to authenticate via Kerberos to the FNAL.GOV realm in this case.

### 6.2.4 Obtaining and Using the Windows AFS Client

If necessary, confirm with your OU administrator or supervisor that this product will meet your needs. Documentation about installing and using the AFS client is provided in the *Strong Authentication at Fermilab* manual:

- Installation and configuration is described in the document *Installing Open AFS Client for Windows NT/2000/XP* at [http://www-oss.fnal.gov/csi/openafs\\_windows/](http://www-oss.fnal.gov/csi/openafs_windows/).
- Use instructions can be found in section 4.7 *Windows AFS Client for File Transfers to AFS Space* [http://www.fnal.gov/docs/strongauth/html/access\\_fermi.html#70521](http://www.fnal.gov/docs/strongauth/html/access_fermi.html#70521).